Environmental Studies Program: Ongoing Study

Field	Study Information
Title	Facilitating Interagency Partnerships in Support of Ocean Mapping, Exploration, and Characterization (NT-21-01)
Administered by	Office of Environmental Programs
BOEM Contact(s)	Michael Rasser (michael.rasser@boem.gov)
Procurement Type(s)	Interagency Agreement
Conducting Organization(s)	National Oceanographic and Atmospheric Administration (NOAA); National Science Foundation (NSF); United States Geological Survey (USGS)
Total BOEM Cost	$1,284,213
Performance Period	FY 2022–2027
Final Report Due	2027
Date Revised	April 17, 2025
Problem	The interagency National Strategy for Ocean Mapping, Exploring, and Characterizing the U.S. EEZ (NOMEC) sets ambitious goals that align closely with BOEM mission needs, and identifies associated challenges. The Strategy (codified into law in 2022) calls for federal agencies to develop creative solutions that advance its implementation. BOEM can and must continue leading and innovating in this shared enterprise.
Intervention	BOEM can better fulfill its mission needs and help implement the National Strategy in a more cost-effective and timely way by actively identifying within-year individual project opportunities and better leveraging federal partner's procurement capabilities for needed services, establishing new formal interagency agreements when necessary. BOEM cross-program and region coordination on this will be key.
Comparison	The regular multi-year Studies Development Process does not usually allow for within-year new projects of opportunity to take advantage of short-notice, highly leveraged collaborative opportunities to respond to emerging priorities (such as seabed minerals) focused on mapping, exploring, and characterizing deepwater benthic environments. BOEM having to solely develop all pieces of large interagency and private partnership projects requires years of advance preparation and provides limited ability to adapt to changing conditions such as ship schedule changes.
Outcome	Funding through this National Studies List mechanism will provide more flexible internal and external mechanisms to capitalize on short-notice, highly leveraged opportunities involving vessels, submersibles, instrumentation, and scientific staff that support BOEM mission-critical research needs and shared interagency/NOMEC priorities.
Context	Characterizing offshore marine habitats, with a focus on deepwater benthic habitats and connectivity thereto. Spatial domain includes all OCS planning areas under BOEM jurisdiction.

BOEM Information Need(s): BOEM requires authoritative baseline information about deepwater habitats and resources to inform NEPA assessments (Affected Environment and potential impacts), permitting/mitigation, resource evaluation, and programmatic decision making across its Regions and program areas (conventional energy, renewable energy, and marine minerals). Such information can be collected via collaborative offshore Mapping, Exploring, and Characterizing (MEC) efforts, per a 2023 law defining how federal ocean agencies can do so through a new National Strategy and supporting Administration bodies. To fully contribute to and leverage these ongoing government-wide efforts and maximize its own return on investment, BOEM's Environmental Studies Program (ESP) requires use of more adaptable procurement and interagency partnership mechanisms.

Background: The 2023 National Defense Authorization Act (in Title CIII "National Ocean Exploration"[1]) codified the existing federal committee organizational structure including the National Ocean Mapping, Exploration, and Characterization (NOMEC) Council and mandated continued implementation of the established National Strategy[2] to map the ocean throughout the U.S. EEZ, identify priority areas, and explore and characterize these priority areas. The Strategy and Implementation Plan[3] calls on all federal agencies with ocean interests (and represented on the NOMEC Council) to develop new ways to better leverage the expertise and resources of multi-sector partnerships and collaboration across federal agencies and non-U.S. Government entities. BOEM has contributed substantially to developing this strategy and has been instrumental in its implementation to date including shared leadership of two high profile, successful NOMEC "Flagship" projects. The ESP has previously led the way in MEC through mission-driven, NOPP-sponsored partnerships with NOAA and USGS including Atlantic Canyons, Deep SEARCH, and EXPRESS. These major efforts have significantly advanced the state of science and furthered federal resource management by increasing knowledge of continental margin geology, the types of seafloor communities, and connectivity with mid-water organisms. However, there is still incomplete information available about the distribution, composition, and sensitivity of deepwater seafloor habitats (i.e., hard bottoms, cold seeps, hydrothermal vents) and their associated benthic communities. For example, through its mapping and exploration activities, Deep SEARCH yielded the first known observation of a tubeworm in the Southeast Atlantic, and discovered a complex, 85 linear mile *Lophelia pertusa* reef system in an unexpected area. Because such deepwater habitats and fauna can potentially be negatively impacted by unmitigated OCS activities, BOEM must continue to better understand these ecosystems and their sensitivity to various impact producing factors. Though BOEM first initiated deepwater study efforts due to conventional energy activities, growing interest in critical marine minerals and the potential for offshore floating wind energy production have substantially expanded these information needs. Therefore, the mapping, exploration and characterization supported through this funding will focus primarily (but not exclusively) on these deepwater habitats in prioritized geographic areas throughout all OCS Regions. Due to the prohibitively high costs of deepwater fieldwork, BOEM must continue to collaborate with partners on research that cost-effectively addresses common information needs. Though quite successful, the historical BOEM template for deepwater research does have inherent limitations. Lessons learned suggest a more responsive, adaptive funding process guided by strategically defined criteria (such as the BOEM-led Interagency Working Group on Ocean Exploration and Characterization's National Strategic Priorities report[4]) could more effectively advance overlapping agency objectives and achieve the broader US government goals outlined in the

[1] https://www.congress.gov/bill/117th-congress/house-bill/7776/text
[2] https://www.noaa.gov/sites/default/files/2022-07/NOMECStrategy.pdf
[3] https://www.noaa.gov/sites/default/files/2021-11/210107-FINALNOMECImplementationPlan-Clean.pdf
[4] https://www.whitehouse.gov/wp-content/uploads/2022/10/NOMEC_OEC_Priorities_Report.pdf

National Strategy and law. By somewhat evolving the historic ESP procurement model for these types of study partnerships, BOEM's ESP can expand the range of potential partners, better respond to short-notice opportunities, adapt more quickly to evolving mission priorities, and maximize return on investment of federal funds.

Objectives: BOEM's ESP must demonstrate continued leadership and innovation by expanding its ability to obtain high value deepwater information through mapping, exploration, and characterization efforts that address ongoing and emerging management needs and do so in a cost-effective manner. The envisioned funding processes and results are expected to support the following objectives:

- Provide a reliable source of ESP funding that can be accessed and directed year-round to take advantage of short-notice collaborative opportunities and respond to emerging priorities.
- Reduce costs and maximize overall return on federal investments by more effectively and strategically leveraging partnerships, with preference given to projects that offer cost sharing and overlapping or complementary science/mission objectives.
- In context of BOEM's current geographic and topical needs, rely on collaboratively developed expert information to guide research project selection such as the Interagency Working Group on Ocean Exploration and Characterization's Strategic Priorities reports that synthesize the recommendations of dozens of federal subject matter experts in different discipline groups and allows for public input.
- Continue advancing mapping, exploration and characterization of sensitive seafloor habitats and fauna to help clarify the type and degree of potential impacts from conventional energy, renewable energy, and marine minerals activities for environmental assessments and programmatic decision making.
- Provide BOEM subject matter experts more consistent access to ship time improving their ability to design and execute studies and deliver critical information.
- Encourage use of emerging technologies including remote sensing tools to survey the seafloor and water column more efficiently, in line with NOMEC Strategy Objective 4.
- Identify and map major geologic seafloor features relevant to understanding potential hazards (such as submarine landslides) and associated risks to energy infrastructure, benthic and cultural resources, and coastal tsunami risk.
- Yield information about water and seabed geochemistry to help better quantify potential baseline shifts.
- Assess relative sensitivity to impacts by comparing food-web ecology, population structure, and genetic diversity across depths and other environmental covariates.
- Provide MEC data that can also be used to inform BOEM resource evaluations, particular for seabed critical minerals and potential seafloor seep locations.
- Complement and build on relevant laws and Administration directives, principally the NOMEC Strategy and Implementation Plan, and maintain ties to the associated implementation bodies.

Methods: A combination of two different funding mechanisms is anticipated to help fulfill the above BOEM objectives and those of the broader NOMEC Strategy. First, ongoing inter-agency agreements (IAAs) with NOAA, USGS, and the National Science Foundation to acquire vessel/submersible/ sensor

and targeted scientific staff support. NOPP involvement or sponsorship (Navy or NOAA) will be pursued where appropriate. Second, a subset of available ESP funds will be reserved or "set aside" every year to be allocated over time to low-cost/high-value interagency opportunities such as has been done through several successful projects already.

Eligible projects will be identified and prioritized according to BOEM's current geographic and topical mission needs. One anticipated source to guide research project selection will be the Interagency Working Group on Ocean Exploration and Characterization's Strategic Priorities reports that synthesize the recommendations of dozens of interagency subject matter experts in different discipline groups. Preference will be given to highly leveraged projects that cost-effectively meet near to mid-term programmatic and science needs. Identifying needs and opportunities will also involve regular discussion with key federal partners that share science and mission objectives (primarily NOAA and USGS), and with non-USG entities where appropriate. Guided by the defined strategic/mission priorities and their situational awareness of regional/programmatic activities, BOEM Regional and Program Studies directors will provide project recommendations to the DES Chief.

Discrete projects can include a broad range of interdisciplinary methods that advance mapping, sampling, and characterization of deepwater habitats. Some examples:

- Ship-based acoustic mapping can be used to measure bathymetry and delineate substrate types and the distribution of important hard bottom areas.
- Unmanned submersibles can provide seafloor imagery and enable collection of chemical, biological and geological samples.
- Trained scientific staff using laboratory materials/protocols (such as traditional taxonomic and genetic techniques) can analyze community composition and impact sensitivity.
- eDNA sampling and referencing can shed new light on biodiversity and species distribution.
- Data management best practices (such as submitting coral and sponge locations in a format consistent with the NOAA Deep Sea Coral Research and Technology Program national geodatabase) can promote data access and usability.

Results will be made available via final reports, peer-reviewed literature, etc. Select data can be archived through the NOAA National Centers for Environmental Information, the Smithsonian, and other official government data and sample repositories.

Specific Research Question(s):

1. Where are the sensitive hardbottom benthic habitats in deepwater areas of the OCS that could be leased for conventional energy, renewable energy, or marine mineral activities?
2. What are the current and projected environmental conditions and biological composition of these habitats? How are species ecologically and genetically connected?
3. How can BOEM and federal partners best collaborate to achieve agency mission objectives and further achievement of the five primary goals of the NOMEC Strategy and the Objectives and milestones of the NOMEC Strategy Implementation Plan?

Current Status: Interagency Agreement with NOAA obligated with four project modifications to date. Interagency Agreement with the National Science Foundation for efficient procurement of the Academic

Research Fleet. Interagency Agreement with U.S. Geological Survey developed with BOEM's Marine Minerals Division for environmental data collection and analysis related to critical minerals in place. Several supported projects' field data collection successfully completed including multiple Pacific expeditions and in Alaska use of the novel Saildrone Surveyor and R/V Atlantis and HOV Alvin to map, explore, and characterize seafloor and water column features in priority areas of the Aleutian Island Chain.

Publications Completed: None

Affiliated WWW Sites: https://www.noaa.gov/nomec

References:

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[1] https://www.whitehouse.gov/wp-content/uploads/2022/10/NOMEC_OEC_Priorities_Report.pdf
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